Physical and Chemical Changes

- Changes can broadly be classified into two types − physical and chemical.
  - The characteristics of physical and chemical changes

Physical Change	Chemical Change
1. The chemical composition of a substance does not change. **2.** Most changes are reversible. **3.** No new substances are formed. For example, Ice → Water → Steam	**1.** The chemical composition of a substance changes. **2.** Most changes are irreversible. **3.** New substances are formed. For example, Paper → Ashes

- Burning a candle is a combination of physical and chemical change.

- A change can occur by heating a substance. For example,
  - The iron blade, when heated, becomes slightly larger in size (**expands**) and when cooled down, contracts (**contraction**).
  - Heating (or melting) of wax is a reversible change and burning of candle is an irreversible change.
  - Conversion of ice to water and vice-versa is also brought about by change in temperature.
- Evaporation is the process in which physical state of a substance changes from liquid state to gaseous at a temperature below its boiling point.
- Melting is the process in which the physical state of a substance changes from solid state to liquid at its melting point.
- There are two phenomenon which involve the action of change in shape and size of a substance:
  1) Expansion: It involves increase in size of an object on heating.
  2) Contraction: It involves decrease in size of an object on cooling.

- Changes around us can be grouped as those that can be reversed (reversible change) and those that cannot be reversed (irreversible change).

Examples of some changes that can be reversed:

- Rolling out a roti from a ball of dough
- Stretching of rubber
- The melting of ice candy
- Folding of a paper
- Dissolving sugar in water

Examples of some changes that can not be reversed:

- Souring of milk
- Cooking of food
- Ripening of fruits
- Sawing of a piece of wood
- Cutting of paper
- Burning of paper
- Conversion of cow dung to biogas.

- A reversible change is the one in which a substance that is undergoing the change can be recovered in its original form.

- The change in which a substance that is undergoing the change cannot be re-obtained is known as an irreversible change. Hence, it can be said that an irreversible change is the one in which a substance that is undergoing the change cannot be recovered in its original form.

- Change brought about by a person or the nature, which is useful, is called a desirable change. On the other hand, change brought about by a person or the nature, which is harmful, is called undesirable change.

Examples of desirable changes

- Formation of manure from animal dung, dead leaves is a desirable change as these waste materials are converted to useful manure.

- Formation of curd is a desirable change as it is more easily digestible than milk.
- Cooking of food is a desirable change.

Examples of undesirable changes

- Spoiling of food in summer is an undesirable change as spoiled food is not edible.
- Flooding of rivers during rainy season is an example of undesirable change. This is because, floods not only damage property and endanger the lives of humans and animals but also have other detrimental effects.
- Breaking of glass articles is an undesirable change as broken glass cannot be rejoined.
- Changes that occur again and again after a fixed interval of time are called periodic changes. For example, beating of heart occurs repeatedly after a fixed interval of time. So it is a periodic change.

  Changes that do not occur repeatedly after regular interval of time are called non-periodic changes. For example, falling of leaves is a non-periodic change as leaves do not fall regularly after regular interval of time.